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(54) Container emptying mechanisms

(57) A mechanism for lifting and inverting a container to discharge its contents, comprising a first frame 1 mounted on a support 2 for movement about pivot 3, a second frame 4 mounted on the first frame by a parallelogram linkage 5, 6 and adapted to engage a container 17, the second frame having a first, lower position spaced from the first frame and a second, raised, position adjacent the first frame, so that by moving the second frame from its lower to its raised position by ram 7, the container is lifted while being held upright, and by then further extending the ram the first frame is pivoted so that the container is further lifted and inverted. A latch 10, 11 is provided between the first frame and the support to prevent movement of the first frame until the second frame is raised, and a further latch 15 is provided between the first and second frames to inhibit relative movement of the frames when the first frame begins to pivot.

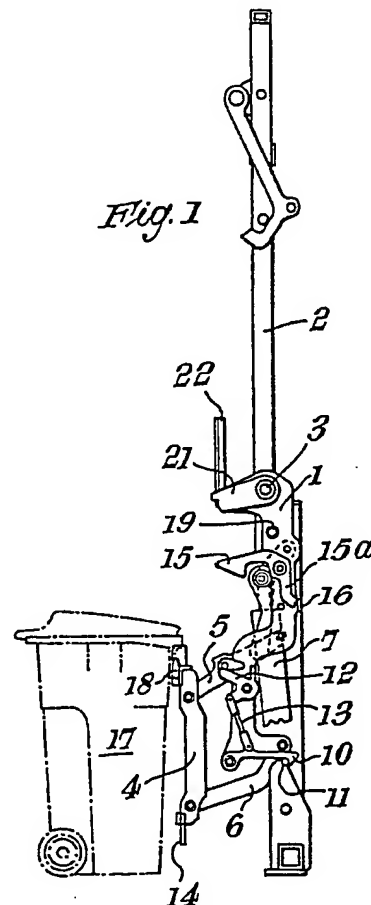


Fig. 3

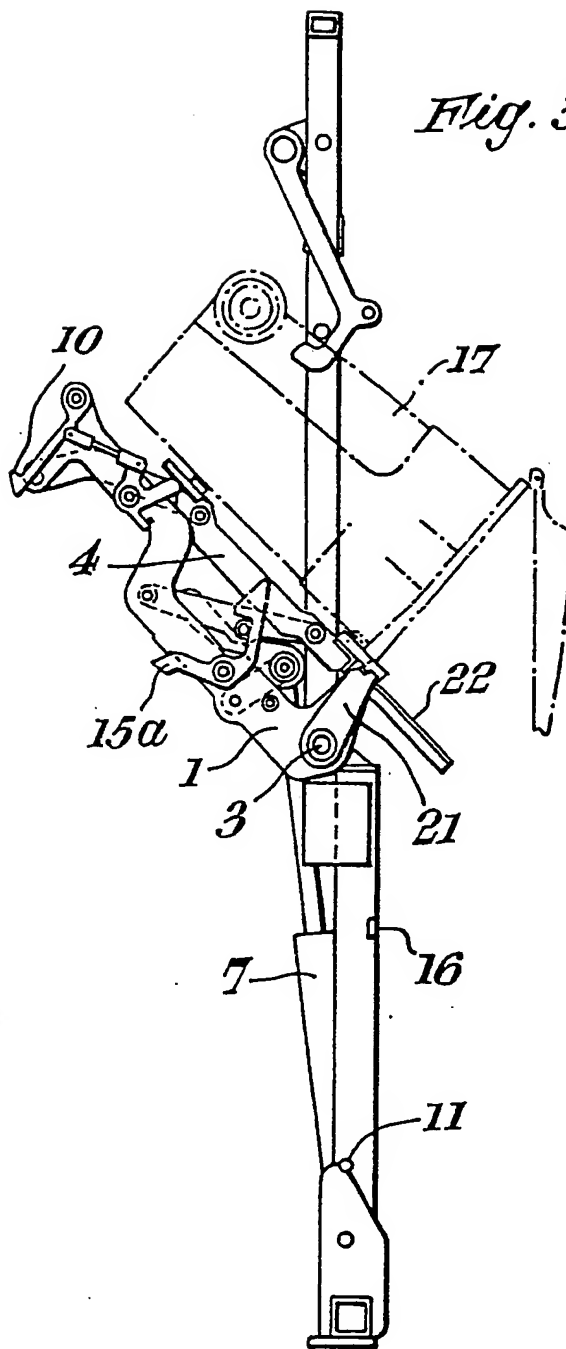
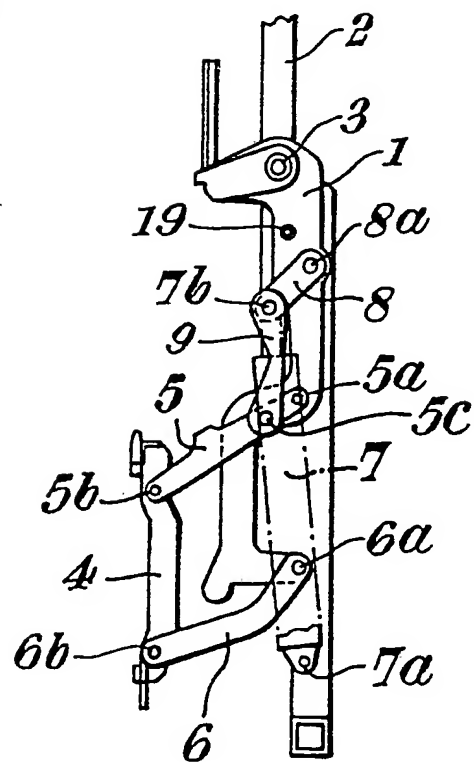


Fig. 4



4 arrives at this position, the striker 14 contacts bellcrank 12 to release the engagement of latch hook 10 with detent 11, which engagement has up till now prevented any movement of first frame 1.

5 With the latch hook 10 released, and link 8 abutting its stop 19, the force exerted by ram 7 causes a moment to be applied to the first frame 1 causing it to rotate clockwise from the position shown in Figure 2. As the first frame leaves this position, the trip arm 10 15a becomes disengaged from the abutment 16, allowing second latch hook 15 to engage a detent 20 on the upper link arm 5. This effectively prevents any movement of the second frame relative to the first frame, and further extension of ram 7 causes the two 15 frames to rotate in unison to the position shown in Figure 3. At this point, the contents of the container 17 will fall out, opening the lid of the container if it has one, and be deposited in the vehicle, compactor or collection container. The first frame is provided 20 with a retaining lug 21 which engages the top edge of the container to retain it in position on the second frame when the container is upturned. A chute 22 may also be provided, to avoid spillage.

To return the emptied container to ground level, 25 the ram 7 is retracted, and the operation is reversed.

During the first part of the retraction, the first and second frames rotate, locked together, to the Figure 2 position. On reaching this position the engagement of detent 16 with trip arm 15a releases the second 30 frame from the first.

Continued retraction of ram 7 causes the second frame to swing downwardly away from the first frame, and striker 14 disengages from bellcrank 12 allowing latch hook 10 to engage the detent 11 and 35 lock the first frame 1 to the support 2.

Clearly, the operation of the mechanism is achieved simply by extending and retracting a single ram, thus avoiding the necessity for complicated hydraulic or electro-hydraulic interlock circuitry.

40 Containers of any suitable size and shape may be used, provided they are open-topped and have means to hold them to the second frame 4. The containers 17 may have hinged or pivoted lids, as described, or may simply be open bins.

CLAIMS

1. A mechanism for lifting and tipping a container, comprising a first frame mountable to a 50 support for pivotal movement about a first horizontal pivot axis, between a first position and a second generally inverted position and a second frame adapted to engage a container and mounted to the first frame by upper and lower parallel pivot arms, 55 for movement between a first lower position away from the first frame, and a second, raised, position adjacent the first frame, first releasable latching means being provided between the support and the first frame to hold the first frame in its first position, 60 and second releasable latching means being provided between the first and second frames to hold the second frame in its raised position adjacent the first frame, the first latching means being released when the second frame is in its raised 65 position, and the second latching means being

engaged when the first frame moves out of its first position, and an actuator operatively associated with the second frame and the support to apply an upward force to the second frame.

70 2. A mechanism according to Claim 1, wherein the actuator is a ram acting on one or more of the pivot arms.

3. A mechanism according to Claim 2, wherein the ram has one of its ends fixed to the support, and 75 has its other end respectively connected to one or more of said pivot arms by means of a trailing link, and to the first frame by means of a further link arranged substantially parallel to the pivot arms.

4. A mechanism according to any preceding 80 Claim, wherein the first releasable latching means comprises a hook pivotally mounted on the first frame to engage a detent on the support.

5. A mechanism according to Claim 4, wherein a 85 striker mounted on the second frame contacts a release lever associated with the hook when the second frame is in its second position to disengage the hook from the detent.

6. A mechanism according to any preceding Claim, wherein the second latching means 90 comprises a second hook element pivotally mounted to the first frame for movement between an engaged and a disengaged position with respect to a second detent associated with the second frame, the second detent being engageable by the second hook 95 element only when the second frame is in its second position, and an abutment being provided on the support to contact a release means associated with the second hook element to retain the second hook element in its disengaged position while the first 100 frame is in its first position.

7. A mechanism according to Claim 6, wherein the second detent is mounted on one or more of the pivot arms.

8. A mechanism according to any preceding Claim, wherein the first frame includes means to 105 engage an upper surface of the container to secure it in position when the first frame is in its second position.

9. A mechanism according to any preceding Claim, wherein the first frame includes a chute to 110 direct material falling from the container when the first frame is in its second position.

10. A mechanism substantially as herein described with reference to Figures 1 to 4 of the 115 accompanying drawings.